

REMARKS

By the present communication, Claims 1, 15, 16, and 17 are amended, and Claims 18-36, directed to a non-elected invention, are requested to be canceled. Applicants reserve the right to pursue the subject matter of the canceled claims under a timely filed divisional application(s).

After entry of the amendment, claims 1 and 3-17 will be pending in this application. Support for the new and amended claims may be found throughout the specification as originally filed, including, but not limited to

Claim 1: Claim 1 as originally filed and paragraph 52, 54, and 55 of the application as originally filed;

Claim 15: Claims 1 and 15 as originally filed;

Claim 16: Claims 1 and 16 as originally filed; and paragraphs 52, 56, and 57; and

Claim 17: Claim 17 as originally filed and paragraphs 66 and 68.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

I. Rejections Under 35 U.S.C. § 112

Claims 1-17 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being incomplete for omitting essential steps. In view of the amendments to Claims 1, 15, 16, and 17, Applicants respectfully traverse these rejections and address each in the order it was set forth in the Office Action.

With regard to Claim 1, the Examiner alleges that the claimed method is incomplete for failing to positively recite a verification step and for the reason that the preamble and recited method steps allegedly do not correspond. Applicants disagree.

Currently amended Claim 1, recites:

A method comprising:
providing a first composition having a first fluid therein;

providing a second composition have a second fluid therein, wherein said second composition includes a predetermined amount of luminescent semiconductor nanocrystals capable of emitting electromagnetic radiation in a narrow wavelength band when excited;

transferring all or a portion of said second composition into said first composition to form a third composition;

exposing said third composition to energy capable of exciting said luminescent semiconductor nanocrystals; and

detecting the electromagnetic radiation emitted from said luminescent semiconductor nanocrystals in said third composition; and

quantifying the luminescent semiconductor nanocrystals in said third composition to verify the delivered amount of said second composition into said first composition to form said third composition.

Applicants note that Claim 1 as amended does recite and does not omit a verification step. In addition, with the deletion of the phrase, “for verifying the transfer of a fluid from a first composition to a second composition,” from the preamble, the claim language is internally consistent and there is no ambiguity with regard to the preamble. Applicants believe the amendments render moot the Examiner’s grounds for rejection.

With regard to Claim 15 and the alleged lack of antecedent basis for the phrase *said second fluid*, Applicants submit that the phrase does have proper antecedent basis. Applicants respectfully direct the Examiner’s attention to Claim 1, where the following phrase is recited: “...providing a second composition having a second fluid therein...” Hence, said second fluid has the proper antecedent basis in Claim 1, from which Claim 15 depends.

With further regard to Claim 15, the Examiner states that it is “unclear as to how the use of a nanocrystal linked to a target pertains to verifying the transfer of fluid.” This concern is misplaced.

Applicants submit that the language of Claim 15, which depends from Claim 1, is clear. Claim 1 is set forth above and Claim 15 is as follows:

15. The method according to claim 1, wherein said second fluid comprises a target and said semiconductor nanocrystal is linked to the target.

By the plain language of Claims 1 and 15, it is clear that that in some embodiments of the claimed methods, the nanocrystal is used to verify a delivered amount of the second fluid, that the second fluid may have a target, and that the semiconductor nanocrystal may be linked to the target. Office Action, page 5. Applicants submit that there is no ambiguity or lack of clarity with respect to these claim elements. Examples of the use of nanocrystal-linked target are discussed in the application at paragraphs 15 and 62, e.g., detection of the target. There is no requirement that such uses be recited in Claim 15. It is clear to the skilled artisan that the claimed methods of fluid verification may also be carried out in the presence of a nanocrystal-linked target as well as the nanocrystal alone.

With regard to Claim 16, it is asserted in the Office Action that step of nucleic acid testing is unclear. It is submitted that as amended, Claim 16 makes clear that the method of Claim 1 may be used in a method of nucleic acid testing.

With regard to Claim 17, it is asserted in the Office Action that "the use of the recited nanomolar nanocrystal concentration is unclear." Applicants submit that the claim now clearly recites that "the luminescent semiconductor nanocrystals are present in the second composition in an amount from about 0.0002 nanomolar to about 20 nanomolar."

In view of the above remarks and amendments, Applicants believe that the rejections have been fully addressed. Applicants respectfully request that the Examiner withdraw the noted rejections.

II. Rejections Under 35 U.S.C. §§ 102/103

Claims 1-9 and 11-16 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,990,479, issued to Weiss *et al*, or in the alternative as being obvious over Weiss. Applicants respectfully traverse this rejection.

The presently claimed invention is directed, in part, to providing a first composition and a second composition, where both compositions include a fluid, and the second composition

includes a predetermined amount of luminescent semiconductor nanocrystals in the fluid of the second composition. When the second composition, or part thereof, is transferred to the first composition, the amount of the second composition that is transferred may be determined.

Applicants submit that Weiss fails to teach or suggest “quantifying the luminescent semiconductor nanocrystals in said third composition to verify the *delivered amount* of said second composition into said first composition to form said third composition.” Emphasis added. Without such a teaching or suggestion of the quantification to verify the delivered amount of the second composition, Weiss cannot be found anticipate or obviate the presently claimed invention.

Weiss is directed to “a luminescent semiconductor nanocrystal compound capable of linking to an organic molecule and capable of exhibiting a detectable change in absorption and/or emitting electromagnetic radiation in a narrow wavelength band and/or scattering or diffracting when excited by either an electromagnetic radiation source...or a particle beam.” Col. 3, lines 50-56. By linking to the organic compound, the luminescent semiconductor nanocrystal is a probe capable of bonding to a detectable substance. Col. 3, line 66 - Col. 4, line 4. The change in absorption and/emission is then detected, “*signifying the presence* in the material, of the detectable substance bonded to the organoluminescent semiconductor nanocrystal probe. Col. 4, lines 15-20, emphasis added.

As shown by Example 1 of Weiss, CdSe/CdS is used as a luminescent semiconductor nanocrystal compound to determine the presence of digoxigenin in a sample. In other words, the luminescent semiconductor nanocrystals are used by Weiss as either a “yea” or “nay” for the presence of the detectable substance. There is no teaching or suggestion in Weiss of a determination of the volume of the either a first composition or a second composition is present in the sample, or of how much of a composition containing the luminescent semiconductor nanocrystals was transferred to the digoxigenin solution. Moreover, there is no teaching or suggestion as whether or not such a quantity may even be determined using the method of Weiss.

Applicants respectfully submit that without a teaching or suggestion of the quantifying step of Claim 1, Weiss cannot be found to anticipate or obviate the presently claimed invention.

As such, Applicants request that the Examiner withdraw the 35 USC §§ 102 and 103 rejections of claims 1-9 and 11-16 over Weiss.

III. Rejections Under 35 U.S.C. § 103

Weiss and Bruchez

Claims 10 and 17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Weiss in view of U.S. Patent No. 6,274,323 issued to Bruchez *et al.* Applicants respectfully traverse this rejection.

Applicants rely on the remarks above with regard to Weiss, and further submit that Bruchez fails to cure the noted deficiencies. Particularly, Bruchez fails to teach a quantifying step where “the delivered amount of said second composition into said first composition to form said third composition” is verified.

Bruchez is directed to assays in which multiple analytes can be detected simultaneously by using more than one semiconductor nanocrystal as a detectable label. Col. 1, lines 18-21. Bruchez then discusses a number of methods in which the semiconductor nanocrystals are used in a manner like that of Weiss; i.e. as a “yea” or a “nay” for the presence of a complex. Bruchez teaches methods of combining a sample on a solid support with a semiconductor nanocrystal conjugate, removing any unbound conjugate, and then detecting the semiconductor nanocrystal. Col. 5, lines 24-col. 7, lines 35. Bruchez also describes the use of standard staining protocols. Col. 27, lines 40-61. In doing so, Bruchez states that then “the sample is labeled with the semiconductor nanocrystals and analyzed for the location and quantity of the target molecule.” Col. 27, lines 56-59. However, locality and quantification are determined only *after* the sample is transferred and the solution with unbound conjugate is washed away: i.e. the amount transferred is never determined.

There simply is no teaching or suggestion in Bruchez of quantifying the amount of fluid transferred, as the unbound conjugate is washed away. Bruchez merely discloses detection of the presence of an analyte and *quantification of the analyte* in a sample using the semiconductor nanocrystal conjugate. Bruchez, fails to disclose or suggest the quantification of a fluid transfer.

As neither Weiss nor Bruchez teaches all of the claimed elements of claim 1, from which all other pending claims depend, neither reference alone or in combination provides the basis for a *prima facie* case of obviousness. As such, Applicants respectfully request that the Examiner withdraw the noted rejections and allow the application to move forward to issuance.

CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is earnestly solicited. The Examiner is requested to contact the undersigned by telephone if a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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By



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